9a

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$$R_1 = H$$
 A_1 A_2 A_3 A_4 A_5 A_5

16b,d,f,h,j
$$\stackrel{d}{\longrightarrow}$$
 $\stackrel{O}{\longrightarrow}$ $\stackrel{C}{\longrightarrow}$ $\stackrel{C}{\longrightarrow}$ $\stackrel{R_1}{\longrightarrow}$ $\stackrel{C}{\longrightarrow}$ $\stackrel{R_1}{\longrightarrow}$ $\stackrel{C}{\longrightarrow}$ $\stackrel{R_2}{\longrightarrow}$ $\stackrel{R_3}{\longrightarrow}$ $\stackrel{C}{\longrightarrow}$ $\stackrel{R_1}{\longrightarrow}$ $\stackrel{R_2}{\longrightarrow}$ $\stackrel{R_3}{\longrightarrow}$ $\stackrel{R_3}$

15c

2a, R = H, Y = cis-CH=CH b, R = P(O)(ONa)₂, Y = cis-CH=CH c, R = H, Y = CO